

Listing of the Claims:

Claims 1 – 37 (Canceled).

38. (New) A projection exposure apparatus, comprising a projection lens having a last optical surface on the image side that is immersed in an immersion liquid that contains highly pure water and at least one additive that dissociates in the water and is, in the dissociated state, transparent for the projection light used in the projection exposure apparatus.

39. (New) The apparatus of claim 38, wherein the at least one additive dissociates in the immersion liquid so that the electrical conductivity of the immersion liquid is between about 4×10^{-8} S/m and about 4×10^{-6} S/m.

40. (New) The apparatus of claim 39, wherein the at least one additive dissociates in the immersion liquid so that the electrical conductivity of the immersion liquid is between about 3.5×10^{-8} S/m and about 6×10^{-7} S/m.

41. (New) The apparatus of claim 38, wherein the highly pure water contains heavy water.

42. (New) The apparatus of claim 38, wherein the at least one additive contains at least one of the group consisting of: LiF, NaF, CaF₂, SrF₂ or MgF₂.

43. (New) A method for the microlithograph

- a) providing a projection lens having an object plane;
- b) providing a photosensitive layer;
- c) arranging a reticle, which contains structures to be projected, in the object plane;
- d) introducing an immersion liquid containing heavy water into an immersion space formed between the projection lens and the photosensitive layer;
- e) bringing the immersion liquid to a target temperature which is at least approximately equal to the temperature at which heavy water has its maximum refractive index for a given ambient pressure; and
- f) projecting the structures onto the photosensitive layer.

44. (New) The method of claim 43, wherein the target temperature is between about 7° C and about 16° C.

45. (New) The method of claim 44, wherein the target temperature is between about 10° C and about 13° C.